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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/526,096	09/14/2005	Ashok Balakrishnan	SMBO6485	2675

  

321	7590	10/01/2007
SENNIGER POWERS ONE METROPOLITAN SQUARE .16TH FLOOR ST LOUIS, MO 63102		

  

EXAMINER	
AMARI, ALESSANDRO V	

  

ART UNIT	PAPER NUMBER
2872	

  

NOTIFICATION DATE	DELIVERY MODE
10/01/2007	ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

uspatents@senniger.com

## Office Action Summary

Application No.

10/526,096

Applicant(s)

BALAKRISHNAN ET AL.

Examiner

Alessandro Amari

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on amdt of 6/21/2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,2,5,11,12,14-18,21-27,36 and 37 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1,2,5,36 and 37 is/are allowed.
- 6) ☒ Claim(s) 11,12,14,16-18,21,22 and 24-26 is/are rejected.
- 7) ☒ Claim(s) 15,23 and 27 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 February 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 9/14/2005.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election without traverse of Group I (claims 1, 2, 5, 11, 12, 14-18, 21-27, 36 and 37) in the reply filed on 21 June 2007 is acknowledged.

### ***Drawings***

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the optical medium comprises a plurality of grooves in a substrate with each groove having a surface which serves as a reflective facet and also having a sidewall, with material with refractive index similar to that of the substrate deposited in spaces adjoining the facets and sidewalls as recited in claim 14 and the substrate comprising an optical planar waveguide which consists of at least one layer of high refractive index surrounded by media of lower refractive index, the plane of said substrate perpendicular to the reflective facets as recited in claims 5, 15 and 27 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate

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changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Objections***

3. Claims 16, 17, 24 and 25 are objected to because of the following informalities:

Regarding claims 16, 17, 24 and 25, the phrase, "the optical waveguide" lacks antecedent basis in the preceding claims. Applicant should further note that none of the drawings show the "optical waveguide" (see drawing objection above).

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 11, 12, 14, 18, 21, 22 and 24-26 are rejected under 35 U.S.C. 102(e) as being anticipated by Cappiello et al (hereafter "Cappiello") US 6,859,317.

In regard to claim 11, Cappiello discloses (see Figures 1A, 12A) a diffraction grating comprising a plurality of reflective facets (4) embedded within an optical medium (3 or 5) as described in column 5, lines 29-54 and column 6, lines 1-13.

Regarding claim 12, Cappiello discloses that the reflective facets form a stepped arrangement as shown in Figures 1A and 12A.

Regarding claim 14, Cappiello discloses (see Figure 1A) that the optical medium comprises a plurality of grooves in a substrate with each groove having a surface which serves as a reflective facet and also having a sidewall, with material with refractive index similar to that of the substrate deposited in spaces adjoining the facets and sidewalls as described in column 5, lines 29-54 and column 6, lines 1-13 and as shown in Figure 1A. It is noted that the term "similar" is not defined in any terms of degree. Therefore, the material of Cappiello meets this limitation.

In regard to claim 18, Cappiello discloses (see for example, Figures 1A, 2, 3) a diffraction grating comprising a plurality of grooves in a substrate with each groove having a surface which serves as a reflective facet, and having effectively no sidewalls between the facets, said sidewalls being rendered effectively invisible by the application of material with a refractive index similar to that of the substrate, the application being in the spaces adjoining both the facets and the sidewalls as described in column 5, lines 29-54, column 6, lines 1-13, column 7, lines 19-37 and 65-67, column 8, lines 20-32 and as shown in Figures 2 and 3.

Regarding claim 21, Cappiello discloses that the reflective facets reflect the totality of light incident to the grating as shown in Figures 2 and 3. It is noted that the

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term "totality" is not defined in any terms of degree. Therefore, the reflective facets of Cappiello meet the limitation.

Regarding claim 22, Cappiello discloses that the reflective facets reflect a substantial fraction of incident light, with light allowed to escape around the edges of the reflecting portions as shown in Figures 2 and 3.

Regarding claim 24, Cappiello discloses that the groove-filling material has a layer structure and indices similar to the optical waveguide as shown in Figure 1A and as described in column 5, lines 29-54 and column 6, lines 1-13 as currently understood by the claim recitation of optical waveguide (see claim objection above).

Regarding claim 25, Cappiello discloses that the groove-filling material is a single material matched in index to the effective index of the optical waveguide as shown in Figure 1A and as described in column 5, lines 29-54 and column 6, lines 1-13 as currently understood by the claim recitation of optical waveguide (see claim objection above).

Regarding claim 26, Cappiello discloses that the groove-filling material is an optical material that is transparent to light of a pre-determined wavelength as shown in Figure 1A and as described in column 5, lines 29-54 and column 6, lines 1-13.

6. Claims 11, 12, 14, 16 and 17 are rejected under 35 U.S.C. 102(e) as being anticipated by Takada et al (hereafter "Takada") US 6,822,796.

In regard to claim 11, Takada discloses (see Figures 1, 2) a diffraction grating comprising a plurality of reflective facets embedded within an optical medium (11) as described in column 5, lines 28-57.

Regarding claim 12, Takada discloses that the reflective facets form a stepped arrangement as shown in Figures 1 and 2.

Regarding claim 14, Takada discloses (see Figure 1, 2) that the optical medium comprises a plurality of grooves in a substrate with each groove having a surface which serves as a reflective facet and also having a sidewall, with material with refractive index similar to that of the substrate deposited in spaces adjoining the facets and sidewalls as described in column 5, lines 28-57. It is noted that the term "similar" is not defined in any terms of degree. Therefore, the material of Takada meets this limitation.

Regarding claim 16, Takada discloses that the groove-filling material has a layer structure and indices similar to the optical waveguide as shown in Figures 1 and 2 and as described in column 5, lines 28-57 as currently understood by the claim language (see claim objection above).

Regarding claim 17, Takada discloses that the groove-filling material is a single material matched in index to the effective index of the optical waveguide as shown in Figures 1 and 2 and as described in column 5, lines 28-57 as currently understood by the claim language (see claim objection above).

***Allowable Subject Matter***

7. Claims 1, 2, 5, 36 and 37 are allowed.
8. Claims 15, 23 and 27 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. Claim 1 is allowable for at least the reason, "a) a reflective facet having at least one coated region coated with electrically conducting material and at least one uncoated region not coated with electrically conducting material; b) at least one sidewall to the reflective facet, the sidewall not coated with electrically conductive material" as set forth in the claimed combination. Claims 2, 5, 36 and 37 are allowable based upon their dependence on claim 1.

Claims 15 and 27 are allowable for at least the reason, "that the substrate comprises an optical waveguide which consists of at least one layer of high refractive index surrounded by media of lower refractive index, the plane of said substrate perpendicular to the reflective facets" as set forth in the claimed combination.

Claim 23 is allowable for at least the reason, "wherein the reflective facets reflect a substantial fraction of incident light, with light allowed to escape through small gaps within the otherwise reflecting portions" as set forth in the claimed combination.

### ***Conclusion***

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Delage et al US 2006/0209411 teaches a grating device for controlling polarization loss.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alessandro Amari whose telephone number is (571)272-2306. The examiner can normally be reached on Monday-Friday 8:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephone B. Allen can be reached on (571) 272-2434. The fax phone



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number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ava  
24 September 2007

  
ALESSANDRO AMARI  
PRIMARY PATENT EXAMINER